

Requested Patent: GB2142403  
Title: ANNULAR DISC ASSEMBLY  
Abstracted Patent: US4582186  
Publication Date: 1986-04-15  
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Application Number: US19840625091 19840627  
Priority Number(s): AT19830002393 19830629  
IPC Classification:  
Equivalents:

AT379665 , AT379665B , BR8403183 , DE3421034 , FR2548300 , IT1176306  
, JP60069328

**ABSTRACT:**

A disc assembly comprises a plurality of substantially radially spaced spokes joined together by intermediate walls of flexible material. The disc assembly can be used to transmit forces in a force transmission system such as a multiple disc clutch. Such a system comprises a member for applying an input force, a member for receiving an output force, and the inventive annular disc assembly, the disc assembly having force transmission and force application regions at its inner and outer edges and at an intermediate region, the noted members being in engagement with at least some of the force transmission and force application regions.

(12) UK Patent Application (19) GB (11) 2 142 403 A

(43) Application published 16 Jan 1985

(21) Application No 8415349

(22) Date of filing 15 Jun 1984

(30) Priority data

(31) 2393/83

(32) 29 Jun 1983

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F16H 51/00 F16D 13/54 13/58

(52) Domestic classification

F2K 4B4 9

F2C 1C9A1A 1C9B2

U1S 2014 F2C F2K

(56) Documents cited

EP 0014990

(58) Field of search

F2C

F2K

F2S

B7C

(54) Annular lever assembly

(57) A lever assembly (9), eg for use in a multi-plate clutch between thrust collar (8) and presser plate (10), comprises radial steel levers (15) embedded in a fabric-reinforced rubber or plastics disc (16).

FIG. 1

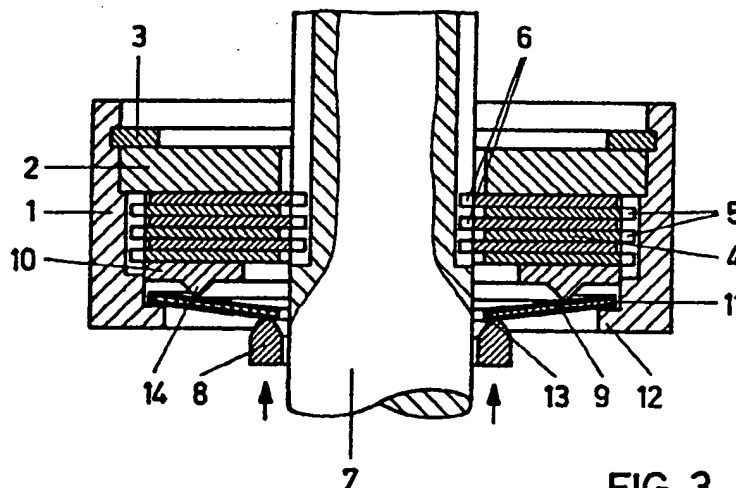


FIG. 3



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FIG. 1

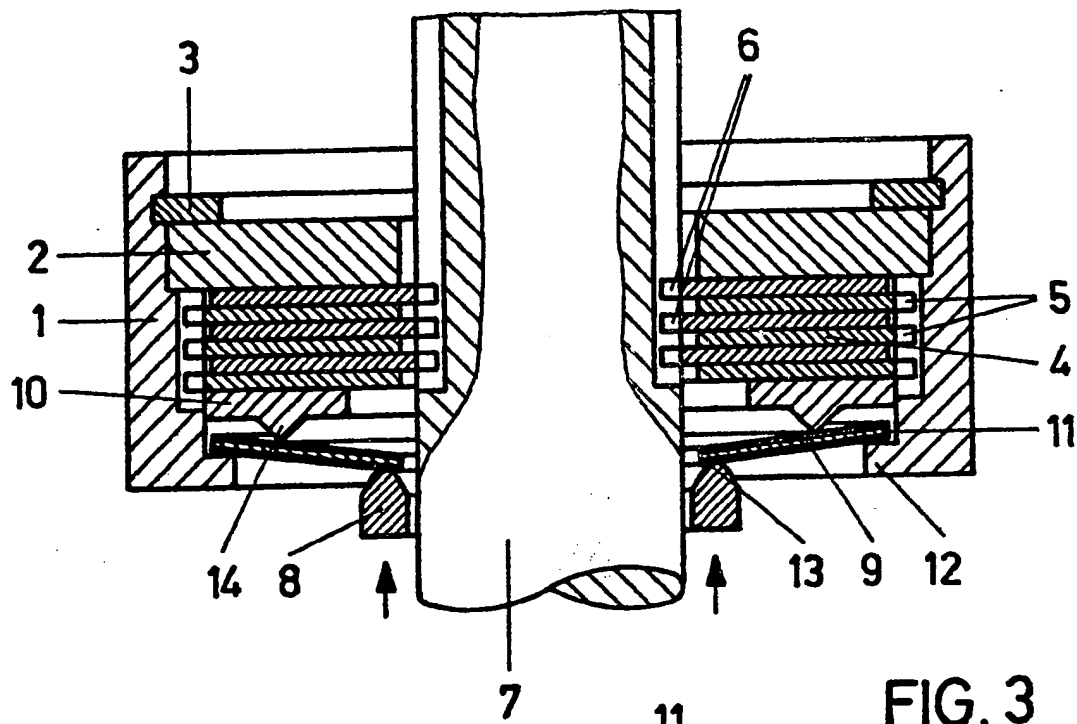


FIG. 2

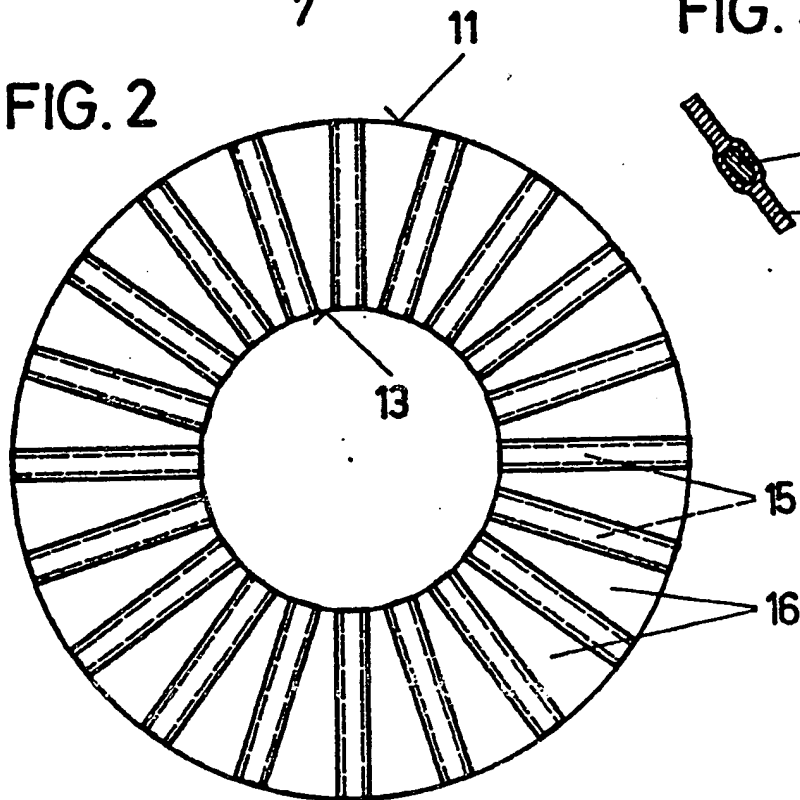


FIG. 3



## SPECIFICATION

### Annular disc assembly

5 This invention relates to an annular disc assembly for transmitting displacement forces. It may be used as a force transmission system in a multiple disc clutch.

Known systems comprise discs or plates of  
10 spring steel which are provided with notches extending radially from the edges. The radial crosspieces formed between adjacent notches are used to transmit the displacement forces. In order to be able to transmit sufficiently  
15 large forces and to withstand the bending stresses occurring in this connection the lever discs have to be relatively thick. The resistance to deformation resulting therefrom has to be overcome when the displacement forces  
20 are transmitted, as a result of which the actuation force required is increased. In addition, the known disc assemblies can break, particularly in the notched regions.

According to the invention there is provided  
25 an annular disc assembly as set out in Claim 1 of the claims of this specification.

An example of the invention will now be described with reference to the accompanying drawings in which:

30 *Figure 1* shows an axial centre section through a disc clutch with a disc assembly for transmitting forces;

*Figure 2* shows the disc assembly in plan; and

35 *Figure 3* shows a section through a detail of the disc assembly on a larger scale.

The multiple disc clutch shown in *Fig. 1* consists of a cup-shaped housing 1 which is sealed by an annular cover 2 is retained in the  
40 housing 1 by means of a spring ring 3. In the interior of the housing 1 there is disposed a stack of discs 4 whose discs are supported in teeth alternately on the outer edge or the inner edge.

45 The discs supported in the outer teeth 5 are mounted in the housing 1, whereas the discs supported in the inner toothing 6 are non-rotatably connected to a shaft 7 by means of grooves formed therein. A thrust collar 8 is  
50 arranged concentrically about the shaft 7 and acts as a force transmission member via disc assembly 9 on a force application member in the form of a pressure plate 10 abutting against the stack of discs 4. The disc assembly 9 is supported with its outer edge 11  
55 on a force application member in the form of an offset portion 12 of the housing 1 and its inner edge 13 lies on the thrust collar 8. The pressure plate 10 has a bead 14 by which it  
60 is supported on the disc assembly 9 between its inner edge 13 and its outer edge 11.

As *Figs. 2 and 3* show, the disc assembly 9 comprises rods 15 which are separate from one another, extend radially and are arranged  
65 at a distance from one another. The individual

rods 15 are connected to one another by intermediate walls 16. The rods 15 advantageously consist of material which is resistant to bending, such as steel, and can have any cross-section. In the embodiment the rods 15 have an oval cross-section. Other typical cross-sections are circular and rectangular. They are embedded in a disc of resilient material, e.g. of rubber or plastics material,  
75 which forms the intermediate walls 16. This material is preferably reinforced with textile fabric.

The displacement forces for actuating the multiple disc clutch are exerted on the thrust collar 8 in the direction of the arrows shown in *Fig. 1*. From the ring they are transmitted via the disc assembly 9 to the pressure plate 10 which presses the stack of discs 4 against the cover 2, as a result of which the clutch is engaged. In this connection the displacement forces are transmitted solely by the rods 15 of the disc assembly 9. The task of the intermediate walls 16 is merely to retain the rods 15 in such a way that the intermediate walls 16  
90 can be thin and have practically no resistance to deformation.

## CLAIMS

1. An annular disc assembly comprising a plurality of substantially radial spaced spokes joined together by intermediate wall of flexible material.
2. An assembly as claimed in Claim 1 wherein said spokes are resilient.
3. An assembly as claimed in Claim 2 wherein said spokes are of steel.
4. An assembly as claimed in any one of Claims 1 to 3 wherein said spokes are embedded in a continuous wall of flexible material.
5. An assembly as claimed in any one of Claims 1 to 4 wherein said flexible material is reinforced with textile fabrics.
6. An annular disc assembly substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.
7. A force transmission system comprising a member for applying an input force, a member for receiving an output force and an annular disc assembly as claimed in any one of the preceding claims, the assembly having force transmission and force application regions at its edges and at an intermediate region, said members being in engagement with at least some of the force transmission and force application regions.